**Factors Leading to Online Learner Satisfaction**

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**ABSTRACT**

This paper explores little-examined factors that potentially affect student perceptions of online learning satisfaction by focusing on (1) the use of concrete methods such as online submissions and videoconferencing, (2) student perceptions of educational integrity, and (3) student perceptions of instructor training. Drawing from 21 other empirical studies, an exploratory factor analysis identified five factors related to student impressions of satisfaction of online learning focusing on these less explored aspects using a survey of 397 business students. The regression analysis indicates that basic online functionality, experience with online classes, technology reliability, and students’ communication preferences are significant predictors of student satisfaction. Interactive methods, student perceptions of instructor training, and control of cheating were not significant predictors.

**INTRODUCTION**

The study of student perspectives with traditional teaching has tended to focus primarily on satisfaction with instructional factors (organization, teaching methods, instructor enthusiasm, etc.), and curricular factors (texts, transferability, readability, etc.) (e.g., Green, Hood, & Neumann, 2015). However, student perspectives on their satisfaction with their own perceived learning achievement can constitute a second element or a different approach (e.g., Palmer and Holt, 2009; Paechter, Maier, and Macher, 2010). A third type of student satisfaction about their education—one generally more peripheral in many studies focusing on the instructional elements—takes account of student perspectives about institutional or non-teaching factors (e.g., quality of class space, price, class size, etc.). Issues related to technology were generally considered negligible. This is not the case today with the study of students’ perceptions of online course satisfaction in terms of teaching quality, learning achievement, and institutional support. Technology mediates the entire academic endeavor in online education, making the interplay of factors dramatically different from traditional education (Song et al., 2004; Young & Duncan, 2014). Students’ perceptions are affected by various types of online rather than face-to-face lectures, technology-mediated rather than intimate group discussions, electronic rather than physical interactions with instructors, etc. Indirectly but as importantly, online teaching also introduces substantial challenges to instructors because of the new techniques and strategies they must master to maintain educational integrity and provide quality in an online mode (Sun et al., 2008; Asoodor, Vaezi, & Izanloo, 2014). This increases the importance of instructor training, self-study, and trial-and-error experience, as well as institutional support (Brinkely-Etzkorn, 2018).

However, while there has been a significant amount of research about the factors leading to student perceptions of satisfaction with online courses in online, higher education environments, it still has numerous gaps (Bates, 2017). Such studies have tended to use items and concepts based on traditional student evaluations, and have often overlooked the actual practices and specific concerns that are involved in contemporary online education. Three examples are highlighted here.

First, previous empirical studies of student satisfaction have not looked at the effects of specific instructional methods, such as online lectures, online grading, online submissions, and videoconferencing. That is, do specific methods, such as the competent use of gradebook, make a significant difference in the determination of satisfaction? Neither has there been an examination of the importance of educational integrity (aka cheating) from students’ perspective (Wilkinson, 2009). This is a major concern for faculty, institutions, and accrediting bodies, but is it a factor of significance for students as well? Finally, there has been little examination of the effects of students’ perceptions of instructor training on satisfaction (Young & Duncan, 2014; Brinkely-Etzkorn, 2018). That is, do students perceive the training of an instructor as significant, apart from the quality of teaching provided by the instructor, and is it a significant factor in their overall satisfaction? These are significant gaps in our understanding of student satisfaction.

The overall purpose of this article is to study unexamined factors that may or may not affect student perceptions of online learning quality, and integrate it with the literature where appropriate. Specifically, we want to find out:

1. What do students say is important or concerning to them related to teaching methods, educational integrity, and instructor training?
2. Do logical constructs emerge when specific items regarding online teaching methods, educational integrity, and perceptions about instructor training are incorporated in an exploratory factor analysis?
3. Which identified factors and control variables are found to be significant in regression analysis with regard to student satisfaction in online classes?

The article first reviews the literature on student satisfaction factors via a taxonomic survey of pertinent literature. This is followed by the methods, results, and discussion sections which provide the basis for the descriptive, factor, and regression analyses.

**LITERATURE REVIEW**

There are hundreds, if not thousands, of studies that discuss student satisfaction with online education, or reference it tangentially. However, there are relatively few studies that focus on specific student satisfaction factors using an empirical protocol. The review began with a standard Google Scholar search using over a dozen terms such as student perceptions of online learning, student satisfaction, student evaluations, online teaching quality, online learning achievement, etc. with numerous cognates and other aspects of particular interest to our study having to do with student cheating, the impact of student opinions of various methods, etc. This review of 500+ titles and abstracts yielded approximately 100 articles to review in depth. After reviewing approximately 100 articles that mention student satisfaction, 60 were eliminated as being insufficiently empirical (qualitative only). As a cross-check, in this phase we also reviewed the literature citing these articles, initially by abstracts, and where appropriate, reviewing the articles in depth for inclusion in our taxonomy. Forty empirical studies were fully reviewed, but only 21 were considered sufficiently focused on student satisfaction and perceptions of quality (as opposed to other constructs) and methodologically robust for inclusion in a comparative analysis. The types of study varied greatly from those with eclectic factors related to student satisfaction (instructional, technology, support, student characteristics, etc.) constituting the majority, some using the Community of Inquiry rubric of three types of instructor-facilitated presence related to teaching, cognitive, and social aspects (Arbaugh et al., 2008), and some using or including the Technology Acceptance Model elements with factors related to ease of use, utility, others’ perceptions, facilitating conditions, and experience (Venkatesh et al., 2003). There is also one study included here that uses a communication framework (specifically focusing on media richness and channel expansion theories), and one that uses a cultural comparison approach.

Not surprisingly given the variety of approaches, there is a large overlap in the factor constructs, and a large heterogeneity in the findings of the various studies. Through a qualitative analysis, nine commonly-used, but overlapping, fundamental constructs are identified. These constructs are: teaching presence, cognitive presence, social presence, experience online and/or sense of efficacy, ease of use and/or comfort with technology, instructional quality, instructor training, student characteristics, and technology reliability. They are briefly defined below.

Teaching presence includes the overall design of classes, the organization of material, facilitation of the class and related rehearsal activities, and “direct instruction” which includes feedback (Arbaugh et al., 2008; Bray, Aoki, & Dlugosh, 2008).

Cognitive presence refers to those aspects of a class or teaching that facilitate deep learning by piquing curiosity, providing a variety of perspectives, integrating different types of materials and activities that spur reflection, debate, and insight, and encouraging immediate transference of learning to work or applications pertinent to students’ future plans. For the purpose of this taxonomy, we include course usefulness in this construct (Arbaugh et al., 2008). The utility of learning for students refers to immediate transfer of knowledge and skills to life situations or work settings, or acquisition of knowledge, skills, and abilities for future professional needs; it is enhanced by demonstrations, simulations, exercises and practice, and feedback for improvement (Van Wart, 2004).

Social presence refers to those elements of a class that encourage students to interact with others, encourage a learning-community approach, and foster open discussions that are more student-to-student based than instructor led (Arbaugh, et al., 2008; Bray, Aoki, & Dlugosh, 2008).

Experience with online courses and sense of efficacy are related constructs that emerge from the technology acceptance literature. As users of technology become more familiar with a technology, they become more adept at using it (increasing their sense of efficacy), more accepting of its weaknesses as well as its strengths, and less likely reject a technology or technological approach because of their increased confidence (Artino, 2010; Al-Gahtani, 2016).

Ease-of-use and/or comfort-with-technology are related constructs that are also derived from the technology acceptance literature (Song et al., 2004; Al-Gahtani, 2016). Ease-of-use simply implies that as the technology is more intuitive and has fewer challenges, complexities, glitches, weaknesses, etc., the more likely people will want to use it (Bray, Aoki, and Dlugosh, 2008). The comfort-with-technology construct is the psychological side of ease-of-use; as users experience greater ease-of-use, they feel greater comfort and less anxiety about technology (Sun et al., 2008).

Instructional quality is a very broad, but rather vague, construct that is sometimes used in student satisfaction research. It generally refers to all types of teaching functions, such teaching presence, cognitive presence, and social presence, and therefore overlaps with them (Sun et al., 2008; Jung, 2011; Asoodor, Vaezi, & Izanloo, 2014).

Instructor training distinguishes courses based on the assumption that instructor training affects and improves instructional quality which in turn affects student satisfaction (e.g., Paechter, Maier, & Macher, 2010). While finding an effect of instructor training on instructional quality is relatively direct, finding significance of instructor training on student satisfaction is more challenging (and one we want to investigate).

Student characteristics refer to those personality features that may affect satisfaction such as learning style, maturity, achievement orientation, etc. (e.g., Hong, 2002; Bolliger & Martindale, 2004; Eom, Wen, & Ashill, 2006).

Technology reliability refers to confidence in the learning management system, internet service delivery, a variety support services such as hotlines, self-help videos, as well as the instructor’s ability to avoid technology issues such as improper date settings and data loss accidents (Sun et al., 2008; Asoodor, Vaezi, & Izanloo, 2014; Bolliger & Martindale, 2004).

In sum, the taxonomy identifies nine constructs in all. Seven of those constructs are relatively distinct, but one (instructional quality) overlaps extensively with at least three others, and another can be considered either an antecedent factor or a factor that is mediated by instructional quality. Table 1 provides the taxonomy which identifies these factor constructs.

**Table 1: Empirical Studies Examining Student Satisfaction Factors in Higher Education Settings\***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Study Authors** | **Teaching presence:** | **Cognitive presence:** | **Social presence:** | **Experience,****Self-efficacy** | **Ease of use, comfort with technology** | **Other factors\*\*** |
| Asoodar, Vaezi, and Izanloo, 2016  | Instructor presence,University support and services | Diversity in assessment,Perceived usefulness | Interaction with others | *Not self-efficacy* | *Not ease of use, not anxiety,*  | *Not instructional quality,* Instructor ability,*Not attitude toward e-learning (learning style),*Technology quality |
| Al-Gahtani, 2016 |  | Usefulness  |  | Self-efficacyexperience | Anxiety | Enjoyment (Instructional quality) |
| Artino, 2010 |  | Task value |  | Self-efficacy |  | Instructional quality  |
| Bray, Aoki, and Dlugosh, 2008 | Found it easy to interact with instructors |  |  | Could persevere in the face of challenges | Found computers easy to use, | Did not prefer social interaction with others when learning (student learning style) |
| Bolliger and Martindale, 2004  | Instructor  |  | Interactivity  |  |  | Technology*Not student characteristics* |
| Clayton, Blumberg, and Anthony, 2018 |  | Interactive | Engaging |  |  | Online perceived as lower instructional quality |
| Cole, 2016  | Instructor communication, satisfaction | Interaction as most important |  |  |  | *F2F interaction preference does NOT predict online learning satisfaction (student characteristics)* |
| Eom, Wen, and Ashill, 2006 | Course structure,Instructor feedback  | Instructor facilitation | Interaction |  |  | Student learning style |
| Hong, 2002 |  |  | *Not interactivity* | Experience  |  |  |
| Joo, Lim, and Kim, 2011  | Teaching presence | Cognitive presence,Perceived usefulness | *Not interactivity* |  | Ease of use  |  |
| Kuo, Walker, Belland, and Schroder, 2009 | Learner-instructor interaction | Learner-content interaction (1st)  | *Not interaction among students* | Self-efficacy*But not* *self-regulated learning* |  |  |
| Lee and Rha, 2009 | Structure  |  | Personal interaction |  |  | Satisfaction was dependent (between these two factors) on what was emphasized |
| Liaw and Huang 2013 |  | Interactive learning environments |  | Self-efficacy | anxiety |  |
| Mohammadi, 2015  | System qualityService quality |  |  |  | *Not perceived ease of use* | Education (instructional) quality |
| Otter, et al. 2013 | Students do more than instructors |  | Feel more disconnected than professors perceive |  |  | Quality comparisons |
| Paechter, Maier, and Macher, 2010 | Instructor counseling and support |  |  |  |  | Instructor’s expertise in e-teaching Student’s achievement goals (student learning style) |
| Palmer and Holt, 2009 | Understanding of what was expected |  |  | Confidence  |  | How well they thought that they were performing (student learning style) |
| Richardson, Maeda, Lv, and Caskurlu, 2017  |  |  | Social presence |  |  |  |
| So and Brush, 2008 | Couse structure,Emotional support |  | *Not social presence* |  |  |  |
| Sun, Tsai, Finger, Chen, and Yeh, 2008  | Course qualityInstructor attitude toward e-learning*Not timeliness* | diversity in assessmentsperceived usefulness | *Not social presence*  | *Not attitude toward computers* | Computer anxiety ease of use | *Not technology* |
| Zhu, 2012 |  |  | Collaborative in both US and Chinese context |  |  | Student (culture) learning styles: Chinese want more instructor-led, low ambiguity teaching |

\*Factor, in *Italic*, indicates that it was “Not” found were actively measured and did not find significance in the study. Studies in which a factor was not examined are blank or eliminated in a factor analysis are left blank.

\*\*Other factors include instructional quality, instructor training, student learning style, and technology reliability

Teaching presence is by far the most identified and supported element affecting student satisfaction. Twelve of the studies identify it, and all that do find it significant. Cognitive presence is identified by nine studies and found significant in all of them. It should be noted, however, that some of the studies were focused on cognitive and social presence, so their findings may be somewhat exaggerated. Twelve studies identified social presence. However, five of those studies did not find social presence a predictor of student satisfaction. Of the nine studies that identified experience and self-efficacy as a construct, six found the construct significant, two did not, and one had mixed findings. Ease-of-use and comfort-with-technology were supported in five studies and not supported in two. Instructional quality was identified in three studies and found significant in two. Instructor training was identified in two studies, and found significant in both. Various aspects of student learning styles and characteristics predicting student satisfaction were identified in six cases, but only found significant in three studies. For the purpose of this taxonomy, cultural characteristics were classified with student learning styles. Technology reliability was identified in two studies, but only found to be significant in one.

With this examination of the types of constructs that have been identified and sometimes found significant, we have a basis on which to compare online teaching methods, educational integrity, and perceptions about instructor training relative to contemporary student perceptions which likely shift over time as students experiences expand, technologies improve, and expectations rise. This is further illuminated by a factor and regression analysis related to student satisfaction.

**RESEARCH METHODS**

An instrument was created to measure both students’ sense of “good learning experience” as well as their “satisfaction of online classes.” To measure the relative importance of student preferences for online or face-to-face classes in comparison to logistical factors, two questions compared factors allowing for an all-that-apply response. A third item asked about the types of classes most appropriate for an online modality (e.g., introductory versus technical classes). To measure students’ perception of quality online classes related to specific techniques, survey items were devised to include seven specific teaching methods and three items related to instructor training and skill. Other items included technology reliability, instructional integrity, and student satisfaction. Demographic information was gathered to determine their effects on students’ levels of acceptance of online classes based on age, year in program, major, distance from university, number of online classes taken, high school experience with online classes, and communication preferences.

This paper draws evidence from a convenience sample of students enrolled in the educational programs of Jack H. Brown College of Business and Public Administration (JHBC) at California State University San Bernardino (CSUSB). The JHBC offers a wide range of online courses for both undergraduate and graduate programs. Students sometimes have the option to choose between both face-to-face and online modes of learning. Both online and face-to-face classes generally have a maximum enrollment of 60 for undergraduate programs and 30 for graduate programs respectively.

A Qualtrics survey link was sent out by nine instructors at the College to students enrolled in their classes during the 2017-18 academic year. In all, approximately 1100 students were contacted, 397 of them responded, representing a 36.1% response rate. Although the sample was drawn from a single business school, it is a relatively broad sample, representing students from several disciplines—management, accounting and finance, marketing, information decision sciences, and public administration.

To increase the reliability of the evaluation scores, composite evaluation variables are formed after an exploratory factor analysis of the individual evaluation items. A principal component method with direct oblique rotation was applied to explore the factor construct of student perceptions of online teaching. The item correlations for student perceptions of quality coefficients were greater than .30 which indicates acceptable use of factor analysis.

A simple least square regression analysis was applied to examine the relationship between various factors and student online learning satisfaction.

**RESULTS**

Respondent demographic information is presented in Table 2. A majority, or 81%, of the respondents are in the age range of 21 to 29. About 92% of them are either juniors or seniors in college. Over 64% of them live more than 10 miles away from campus. Less than 10% of them have never taken online classes and about 80% of them have taken at least two online courses. Only about 10% of them have had one or more online experiences in high school. Only 5% of them report that they never communicate to others in face-to-face classes, whereas over 27% of the students who had online experiences reported that they never communicate with others in online classes.

**Table 2: Demographic Information of the Participants (n=397)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | **Freq.** | **Valid %\*** |   |   | **Freq.** | **Valid %\*** |
| Age |  |  |  | Number of HD/OL classes have taken |  |  |
| Under 20 | 29 | 7% |  | None | 34 | 9% |
| 21 to 29 | 320 | 81% |  | Only one | 48 | 12% |
| 31 to 39 | 32 | 8% |  | 2 to 4 | 224 | 57% |
| 40 or older | 16 | 4% |  | 5 to 7 | 67 | 17% |
| Year in Program |  |  |  | 8 to 10 | 11 | 3% |
| Freshman | 5 | 1% |  | More than 10 | 11 | 3% |
| Sophomore | 8 | 2% |  |  |  |  |
| Junior | 137 | 35% |  | Had HD/OL classes in high school |  |  |
| Senior | 224 | 57% |  | Yes | 38 | 10% |
| Graduate | 18 | 5% |  | No | 357 | 90% |
| Major |  |  |  |  |  |  |
| Finance | 38 | 10% |  | Communicate to others in HD/OL classes |  |  |
| Accounting | 84 | 21% |  | Almost never | 55 | 27% |
| Management | 71 | 18% |  | Infrequently | 44 | 21% |
| Marketing | 60 | 15% |  | Sometimes | 63 | 31% |
| Public Administration | 33 | 8% |  | Quite frequently | 29 | 14% |
| Information Decision Sciences | 52 | 13% |  | Very frequently | 15 | 7% |
| Other | 59 | 15% |  |  |  |  |
| Distance to University |  |  |  | Communicate to others in F2F classes |  |  |
| Less than 1 mile | 31 | 8% |  | Almost never | 10 | 5% |
| 1 to 5 miles | 50 | 13% |  | Infrequently | 19 | 9% |
| 6 to 10 miles | 61 | 15% |  | Sometimes | 68 | 32% |
| 11 to 25 miles | 158 | 40% |  | Quite frequently | 70 | 33% |
| More than 25 miles | 97 | 24% |   | Very frequently | 46 | 22% |
| \*Percent eliminating missing values |  |  |  |  |  |

Students were asked to respond to a list of evaluation questions about online course experiences (see Table 3). The descriptive data indicate that for students in the sample, based on a five-point Likert scale, the best rated functions are the most basic ones, such as online submissions (Mean=4.30), gradebook (Mean=4.06), quizzes (Mean=4.15) and online grading (Mean=3.99). Satisfaction as noted by enjoyment and general impression are moderate (both Means=3.46). Students overall are quite comfortable with technology (Mean=3.94). Perceptions of the quality of interactive features are rated substantially lower when examining the use of video lectures (Mean=3.40), small groups (Mean=3.32), and videoconferencing (Mean=3.17). Students are relatively neutral on instructor training and impact, when considering the students’ perception of the impact of online training (Mean=3.23), students’ perception of the impact in general teaching skills (Mean=3.17), and instructor impact on student enjoyment (Mean=2.94). Students were asked: assuming that you had a full array of hybrid/online classes available, and that they were well taught (based on your best experiences), how much would online education make up your entire course selections going forward? Overall, 18% students said less than 10%, 39% said from 10 to 50%, 32% said 50 to 90%, and 10% said 90 to 100%. According to university statistics, business and public administration students currently take 19.6% of their classes online (hybrid or fully online in 2018). So, if both availability and quality were increased, the increase in online instruction would be substantial.

**Table 3: Survey Items of Student Perception of Online Classes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item** | **Question**From your experience with online teaching, what has been the average quality in the use of these methods by instructor? Please mark N/A if you have not experienced this feature: | **n** | **Min** | **Max** | **Mean** | **Std Dev** |
| Online Grading |  Online grading of assignments by instructors (from very poor to very good) | 361 | 1 | 5 | 3.99 | 1.03 |
| Online Submission | (Same as above): Allowing students to make online submissions | 358 | 1 | 5 | 4.30 | 0.85 |
| Online Gradebook | (Same as above): Online gradebook | 359 | 1 | 5 | 4.06 | 0.99 |
| Online Quizzes | (Same as above): Online quizzes | 352 | 1 | 5 | 4.15 | 0.92 |
| Video Conference | (Same as above): Zoom or other videoconference methods | 316 | 1 | 5 | 3.17 | 1.29 |
| Group Discussion | (Same as above): Small groups discussions (chat rooms) | 342 | 1 | 5 | 3.32 | 1.22 |
| Video Lecture | (Same as above): Video lectures | 330 | 1 | 5 | 3.40 | 1.16 |
| Instructor's Training | How much difference do you think that the instructor’s training in online teaching makes in their teaching online classes? | 392 | 1 | 5 | 3.23 | 1.15 |
| Instructor's Teaching Skill | How much difference do you think that the instructor’s general teaching skills make in terms of their teaching online classes? | 392 | 1 | 5 | 3.17 | 1.23 |
| Instructor Making a Difference | How much difference does your instructor make in your enjoyment of an online class? | 391 | 1 | 5 | 2.94 | 1.25 |
| Technology Reliability | To what degree is the reliability of the technology itself (e.g., outages, glitches, etc.) a concern? (from very import to not important) | 391 | 1 | 5 | 3.57 | 1.18 |
| Control of Cheating | If you have taken hybrid/online classes, to what degree can instructors reduce and catch cheating? (from no effect to an enormous effect) | 359 | 1 |  5 | 2.72 | 1.12 |
| Enjoyment of Online Class | My enjoyment of online learning is (from very low to very high) | 380 | 1 | 5 | 3.46 | 1.13 |
| Impression of Online Class | What is your general impression of online learning? (from very bad to very good) | 393 | 1 | 5 | 3.46 | 0.99 |
| Choice of Online Class | Assuming that you had a full array of hybrid/online classes available, and that they were well taught (based on your best experiences), how much would online education make up your entire course selections going forward? (1=Less than 10%, 2=10-50%, 3=50-90%, 4=100%) | 391 | 1 | 4 | 2.35 | 0.89 |
| Comfort with Technology | In general, my comfort level with online learning in terms of the technology is (from very low to very high) | 391 | 1 | 5 | 3.94 | 0.92 |

Five factors were identified with Eigen values greater than one (see Table 4). The first, labeled Basic Online Modality Functions, had high loadings (above 0.60) in Online Grading, Online Submission, Online Gradebook, and Online Quizzes. The second, labeled Student Satisfaction With Online Learning (what then functions as our operational definition and dependent variable), had high loadings on Enjoyment of Online Classes, Impressions of Online Class, Comfort with Technology, and Choice of Future Online Classes. These items touch on the three aspects of student perspectives defined at the beginning of the paper related to teaching quality, perceptions of learning achievement, and course quality not related to teaching (e.g., Comfort with Technology). The third, labeled Interactive Methods, had high loadings on Video Conferences, Video Lectures, and Group Discussions. The fourth, labeled Instructor Capability, had high loadings on Instructor’s Training, Instructor’s Teaching Skills, and Instructors Making a Difference. And the fifth, labeled System Trust, had high loadings on Technology Reliability and Control of Cheating.

**Table 4: Factor Loading**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | **Factor 1****Online Modality** | **Factor 2****Student Satisfaction** | **Factor 3****Interactive****Methods** | **Factor 4****Instructor Capability** | **Factor 5****System** **Trust** |
| Online Submission | 0.8622 |  |  |  |  |
| Online Grading | 0.8380 |  |  |  |  |
| Online Gradebook | 0.8333 |  |  |  |  |
| Online Quiz | 0.6314 |  |  |  |  |
| Enjoyment of Online Class |  | 0.8420 |  |  |  |
| Impression of Online Class |  | 0.7959 |  |  |  |
| Comfort with Technology |  | 0.7032 |  |  |  |
| Choice of Online Class |  | 0.6878 |  |  |  |
| Video Conference |  |  | 0.8851 |  |  |
| Video Lecture |  |  | 0.8301 |  |  |
| Group Discussion |  |  | 0.7272 |  |  |
| Instructor's Training |  |  |  | 0.8887 |  |
| Instructor's Teaching Skill |  |  |  | 0.8487 |  |
| Instructor Making a Difference |  |  |  | 0.6222 |  |
| Technology Reliability |  |  |  |  | 0.7269 |
| Control of Cheating |   |   |   |   | 0.7260 |
| Note: Five factors explain 66% of the variance. Decimal places and loadings less than .30 omitted |

To ensure the reliability of the composite variables, the Average Variance Extracted (AVE), the Composite Reliability (CR), and the Cronbach’s α are reported (see Table 5). A CR and Cronbach’s α values of 0.7 or greater are considered acceptable. As reported in Table 5, the CR values for four composite variables—Online Modality, Student Satisfaction, Interactive Methods, and Instructor Capability—are greater than or equal to 0.84 and Cronbach’s α values are greater than or equal to 0.71, demonstrating that these composite variables have adequate reliability scores. However, the fifth factor—System Trust has relatively low CR (=0.69), AVE (=0.53), and Cronbach’s α (=0.20). Therefore, the fifth factor as derived from the exploratory factor analysis is not included; instead the two variables—Technology Reliability and Control of Cheating are treated as separate variables. The Partial Correlation values, partialed with respect to all other variables, are also reported in the table.

**Table 5 Reliability and Variance among Factors**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | **Mean** | **Std Dev** | **AVE** | **CR** | **Cronbach's α** | **Online Modality** | **Interactive** **Methods** | **Instructor Capability** | **Student Satisfaction** |
| Online Modality | 16.55 | 3.04 | 0.63 | 0.87 | 0.82 | **0.7960** |   |   |   |
| Interactive Methods | 9.83 | 3.13 | 0.58 | 0.84 | 0.80 | 0.3053 | **0.7600** |  |  |
| Instructor Capability | 9.33 | 2.90 | 0.68 | 0.86 | 0.71 | 0.0319 | 0.0072 | **0.8254** |  |
| Student Satisfaction | 13.29 | 2.98 | 0.64 | 0.84 | 0.77 | 0.2047 | 0.1259 | 0.0219 | **0.8004** |
| Notes: AVE=average variance extracted; CR=Composite reliability. The diagonal elements (in bold) represent the root of AVE. The 5th factor was rejected due to low reliability.  |

A simple least square regression analysis was applied and the results are presented in Table 6.

**Table 6: Summary of Multiple Regression Analysis for Predicting Students' Satisfaction to Online Class**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Analysis of Variance** |   |   |   |   |
| **Source** | **DF** | **Sum of Squares** | **Mean Square** | **F Ratio** |
| Model | 11 | 396.56 | 36.05 | 4.84 |
| Error | 251 | 1867.84 | 7.44 | **Prob > F** |
| C. Total | 262 | 2264.40 |  | <.01\*\*\* |
| **Parameter Estimates** |   |   |   |   |
| **Term** | **Estimate** | **Std Error** | **t Ratio** | **Prob>|t|** |
| Intercept | 7.88 | 1.63 | 4.83 | <.01\*\*\* |
| Year in Program | -0.46 | 0.30 | -1.54 | 0.12 |
| Age | 0.38 | 0.33 | 1.15 | 0.25 |
| Distance to University | -0.12 | 0.15 | -0.83 | 0.41 |
| Number of hybrid/online classes have taken | 0.58 | 0.21 | 2.75 | <0.01\*\*\* |
| Communicate to others in F2F classes | -0.30 | 0.16 | -1.96 | 0.05\*\* |
| Communicate to others in HD/OL classes | 0.49 | 0.15 | 3.20 | <0.01\*\*\* |
| Control of Cheating | 0.24 | 0.17 | 1.42 | 0.16 |
| Technology Reliability | 0.30 | 0.15 | 1.97 | 0.05\*\* |
| Instructor Capability | 0.01 | 0.07 | 0.17 | 0.86 |
| Interactive Methods | 0.00 | 0.06 | -0.06 | 0.95 |
| Online Modality | 0.18 | 0.06 | 3.11 | <0.01\*\*\* |
| \****p***<.10, \*\****p***<.05, \*\*\****p***<.01. |  |  |  |  |

Factors found to be significant in affecting student satisfaction in this study include the number of classes taken in the past, communication preferences related to face-to-face and online modalities, technology reliability, and the basic online modality (i.e., the use of online submission, grading, grade book, and quizzes). However, factors that were not found significant included year in program, age, distance to the university, educational integrity (i.e., control of cheating), instructor capability, and interactive methods.

**DISCUSSION**

The descriptive data strongly suggest that students are most interested in the basics of online classes related to basic methodological functionality (roughly equivalent to *teaching presence*). As found in many studies, many students are highly interested in what they perceive as assistance with learning: the organization of the course, the clarity of presentations and materials selected, the accessibility of the instructor, and the quality of feedback (Bolliger & Martindale, 2004; Young & Duncan, 2014; Sun et al., 2008; Asoodor, Vaezi, & Izanloo, 2014). The quality of organization and course pre-planning are highly important to students whose attention is divided by other courses and external interests, and who are easily frustrated with confusion or vagueness in instruction. Readings and lectures, among other information-imparting techniques, can be clear and easy to understand, or considered excessively complicated and poorly explained to students. A somewhat surprising note in this regard is the inclusion of quizzes. Follow-up focus groups used to clarify some of the less clear findings indicated that students see quizzes (with no or low points associated) as rehearsal opportunities critical to practice and success in testing. For example, accounting and finance students indicated that quizzes are critical to ensure that they understand their readings and lectures. Electronic quizzes (and homework) were generally considered preferable to hand-graded work because of the speed of response.

While a sense of learning community is more important for some types of classes in the humanities, education, and social sciences, most students across disciplines find the physical connectedness of learners and the instructor, student-to-student interactions, and group learning to be important (Arbaugh, et. al., 2008; Artino, 2010; Clayton, Blumberg, & Anthony, 2018; Liaw & Huang, 2013; Richardson et al., 2017; So & Bush, 2008; Wyatt, 2005); but not all studies find social and cognitive elements significance on student enjoyment (e.g., Chang & Kang, 2016). The *cognitive and social presence* factors were most likely to be represented in this study by videoconferencing, pre-recorded lectures by instructors, and discussion groups. They were much less important on average for students in this study, and did not achieve significance in regression analysis. However, a negative finding here begs additional questions before asserting that social and cognitive factors do not significantly affect student satisfaction across most or all situations. If instructors improved their use of videos, videoconferencing, and small group discussion groups (as a function of instructional quality), would it affect significance (see Draus, Curran, & Trempus, 2014)? As students become exposed to more and more technologically sophisticated classes, will it affect significance?

Overall, descriptively students generally believe that they can detect varying levels of *faculty training*; however, as a factor related to student satisfaction, it is not statistically significant. In an interesting response about the degree to which instructors affect student enjoyment are among the lowest in the survey. Because many online classes reduce lecture time and increase rehearsal and feedback time, students generally believe they are even more responsible for their personal achievement of learning than in face-to-face courses (Otter et al., 2013; Seok et al., 2010; Eom, Wen & Ashill, 2006). Indeed, despite the perceptions of many faculty to the contrary, Hoffmann & Oreopoulos, (2009, 83) assert that “the importance of college instructor influences [on student achievement] is small.”

While *experience with online classes* in high school was not significant, experience with online classes at the university was; more classes meant that they tended to be more satisfied and that factor did reach significance. This related to the high level of importance placed on *comfort with technology* which reached significance. A different but related issue that was rated moderately high and significant for student satisfaction was *technical reliability*. In focus groups there were few complaints, but when problems occur, they are frequently very upsetting and/or frustrating for students who sometimes feel helpless to deal with malfunctions and glitches in the system. On the other hand, problems with educational integrity (a factor previously unexplored in terms of student satisfaction) were scored less important than other items but it turn out not to be significant. Student did not see that as a factor affecting their online learning satisfaction. However, that doesn’t mean faculty should not try to prevent cheating; it is still a significant issue for faculty in designing online classes. A *student characteristic* that was very important was students’ communication patterns. Those students who communicated a lot in face-to-face classes were less likely to be satisfied in online classes. This begs the question, if online instructors did a better job in providing those students averse to online modalities with quality online interaction opportunities, would those student preferences change over time? For example, online conferencing has vastly improved the visual options, easy interaction via video and sidebar chat, and even simple and automatic distribution of students into small groups. Other student characteristics that were not significant included age, despite the perception that younger people are more adept and more comfortable with technology. Nor was the year in program of study significant. Furthermore, even though students at a distance might value the opportunity of online learning more, it did not translate into higher levels of satisfaction.

**CONCLUSION**

With the purpose to see if various, under-examined aspects of online instruction align with past studies of student satisfaction, this study has several contributions to the literature. First, it examined the relationship of seven specific instructional methods with student satisfaction. Basic online functions relating to online submissions, grading, gradebook, and quizzes constituted a factor, were significant, and were consistent with the teaching presence construct. Three additional instructional methods, videoconferencing, group discussions, and prerecorded lectures constituted a separate factor overlapping with the cognitive and social presence constructs; however, the use of methods commonly associated with social/cognitive teaching were not significant in this study as a predictor of student satisfaction. Since the literature has heterogeneous results in this regard, it does seem possible that a study focusing on “advanced” teaching methods might find an impact with more sharply defined boundary conditions than in the current study.

Instructor training items constituted a coherent factor, but are not significant for student satisfaction in this study. Technology reliability and control of cheating load well as a fifth factor (labeled here as system trust) but have a low Cronbach’s α. Therefore, they are not included in the analysis as a factor, and instead the two variables—technology reliability and cheating—are treated as separate variables. As partialed variables, technology reliability is significant, while control of cheating is not significant in terms of student satisfaction. Students’ communication preferences in face-to-face versus online modes was also found to be a significant factor in determining student satisfaction.

There are a number of noteworthy study limitations. The study uses a single method and a single institution rather than multiple methods and an array of sources. Further, the study population is narrow—business and public administration students—whose preferences cannot be assumed to be similar to students in other disciplines (Arbaugh, 2013). These limitations restrict the generalizability of the study considerably, and must be aggregated with other studies to assure wider applicability.

Because student satisfaction is so important, and because the underlying elements of online instruction are changing, it is critical that future research probe this area more thoroughly, both quantitatively and longitudinally. In this study, the quality of basic online modality features are very significant, but more advanced features are not. Is that simply because they are unlikely to ever become significant predictors of student satisfaction, or because they are still new, student expectations have yet to become more demanding, or possibly that the quality of implementation is so low that they are largely irrelevant to students at this point? While the *perceptions* of instructor training are not significant predictors of student satisfaction, is it possible that *actual* training interventions do affect student satisfaction? Indeed, there are many areas that will benefit from further study in student satisfaction, as the capacity and demand for online education continues to increase and the technology used in the field continues to evolve.

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